

REMARKS

Reconsideration of the application is requested in view of the amendments above and comments which follow.

The specification includes several passages in the background sections that describe a problem with prior art systems. This problem is described correctly. The specification then goes onto describe a solution, referred to as an "escape mechanism", as conventional (see passages bridging pages 5 and 6 of the specification). This is not correct.

The offending passage also includes a statement that describes this solution as "the near-far effect". This is not correct either.

The one sentence from the specification, specifically that found between lines 6 - 7 on page 6 "This situation is known as the 'near-far' effect" has been deleted. This is a correction of the specification, since the near-far effect is well known and does not involve the increase of downlink power as a response to interference experienced on the uplink ascribed to it in the preceding sentences. There is a reference to this near-far effect for example in the following document from Qualcomm, the pioneering company in the field of CDMA, a field to which the near-far problem is particularly relevant and to which the invention is primarily aimed. See in particular page 16 section 2.1.3 and Figure 5:

http://www.qualcomm.com/common/documents/white_papers/Commonalities_CDM_A2000_WCDMA.pdf

The Examiner has rejected the claims on the basis of the prior art, beginning in numbered section 1 on page 2 of the Office Action. Reconsideration is requested.

By way of a recap, the problem that the invention seeks to solve and the solution are as follows:

A terminal from network A may be close to a base station for network B ("BSB"), to which it does not have access, while the base station to which it does have access ("BSA") is further away. As a result, the terminal transmits at high power and the out of band transmissions may jam the reception of adjacent uplink

bands at the nearby base station BSB. This would be a particular problem in CDMA systems, since one troublesome user could potentially jam many users on an adjacent band.

Normally this situation is automatically resolved, since the troublesome user is forced to use another band or drops the call, as the proximity to the base station of another operator will mean that the downlink to the terminal will be jammed by out of band transmissions if the base station is operating in an adjacent frequency band. Because operator A and operator B normally use the same frequency separation between uplink and downlink, it works out that if a terminal is using an uplink band adjacent to one being used by a nearby base station, then it will also be using a downlink frequency adjacent to one being used by a nearby base station.

The problem arises if one operator is using a different duplex frequency separation than that used by another operator, for example by using an extension band for the downlink while the other operator is operating with the downlink in the core band. In this case, a terminal from one operator may jam an adjacent uplink band of another operator but it may not experience jamming on its downlink, so it won't be forced to use another band or drop the call.

The system described in the present patent application seeks to solve this problem by measuring the power received by the terminal in the downlink channels that would be used by a base station that is potentially a victim of uplink interference on the assumption that the base station is operating in the core band while the terminal is using the extension band. The power measurement can be used to give an indication that the terminal is close to a base station that is operating on an adjacent uplink frequency band and to derive an approximation of path loss from that base station to the terminal, which may be assumed to give an approximation of the path loss on the link from the terminal to the base station. The terminal voluntarily limits its output power to a level that is calculated to be unlikely to jam a nearby base station. This can be thought of as a "polite protocol" that would be adopted by operators on a reciprocal basis, and may potentially form part of a standard.

Prior Art

The examiner has rejected claim 1 and the independent claims on the grounds of obviousness, given two prior art references.

The first reference (Kumar et al., US 6434367) describes a system in which a base station determines whether a terminal is transmitting at a power which may cause interference to an adjacent uplink channel; the terminal responds to power control signals sent on a power control downlink channel. As has been pointed out in the response to the previous office action, the system described in Kumar is quite different from the present invention in that the method is carried out at a base station and a downlink channel to a terminal is not monitored.

The second reference (Hamabe, US 6574456) describes a system in which there are two system operators to which terminals can be registered. There is a risk of a terminal causing interference to an adjacent uplink channel received by a base station to which the terminal does not have access if the terminal is near to the base station. The likelihood of causing interference in this way is determined by measurement of the received power of a special downlink signalling channel known as a perch channel. The perch channel is a broadcast channel, that is to say it is the same channel for all users. By contrast, the present invention measures the received downlink power of an ordinary channel for data transmission and does not measure the power received in a perch channel.

In response to the examiner's rejections, the claims are amended with words to the effect that the monitoring is of the downlink channel which is paired with the uplink channel adjacent to the uplink channel used by the terminal. The perch channel is not paired with an uplink channel, since the perch channel is a broadcast channel. The concept of pairing uplink and downlink channels is described in the specification, in particular figure 4 and page 5 lines 1 - 4.

The advantage of monitoring the downlink channel paired with the adjacent uplink channel is that it gives an indication of whether the adjacent channel is in use; if the adjacent channel is not in use, it is unnecessary to avoid interference with it.

This information is obtained without the need for communication with the base station of the other operator. This feature is not disclosed by Hamabe.

Hence, the suggested amendment distinguishes the present invention from the combination of Kumar and Hamabe.

A reference has been cited by the EPO in the recent examination of the European equivalent of the present application (specifically in an examination report dated Sept 3 2007): the document referred to as D1, which is a 3GPP specification document TR25.889. This reference was disclosed to the USPTO in an IDS received by the USPTO on Dec 29 2005, and so it appears that the USPTO has already considered this reference and apparently does not consider it to be relevant.

Applicant is of the opinion that D1 is relevant to the previously pending claims and accordingly has amended the claims to specify that a second terminal is in communication with a base station to which the first terminal does not have access.

The present invention solves an entirely different problem to that addressed in D1, since the present invention relates to interference caused by a terminal of one operator to a base station of another operator, rather than another base station of the same operator as described in D1. In the situations addressed by embodiments of the present invention, a terminal may be transmitting in close proximity to a base station but will be unable to hand over to it because handover between operators is not possible. Also, the base station of another operator is necessarily operating on a different channel due to the allocation of different frequency spectrum to different operators.

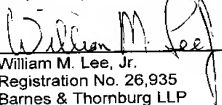
In this context, the power at which interference may be caused to an adjacent channel is not simply related to the power that would cause interference to the same channel by the ACLR, since the adjacent channel is associated with a different base station. As a result the power budget is entirely different.

Given the above, it is submitted that this application is in condition for allowance, and the Examiner's further and favorable reconsideration is requested.

As this response is being submitted during the fourth month following the Examiner's Office Action, an appropriate Petition for Extension of Time is also submitted herewith.

February 28, 2008

Respectfully submitted,

A handwritten signature in dark ink, appearing to read "William M. Lee, Jr.", is written over a horizontal line.

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